Figure 1.

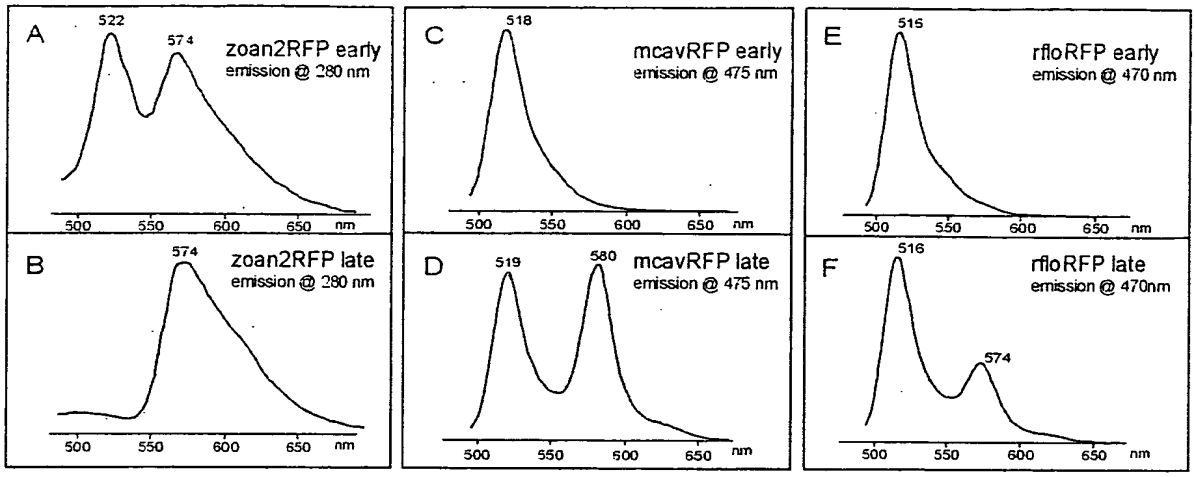

Figure 2.

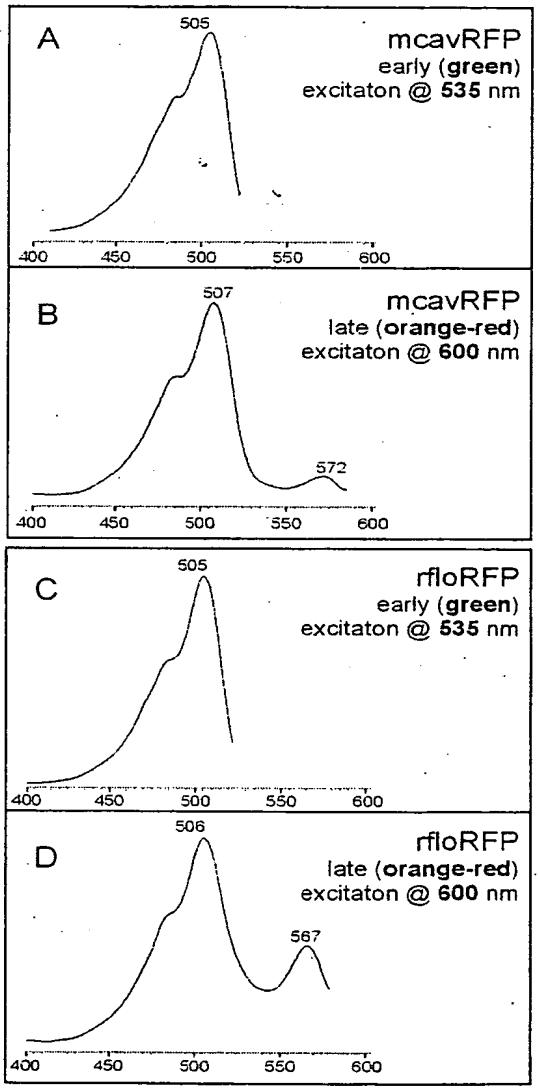

Figure 3.

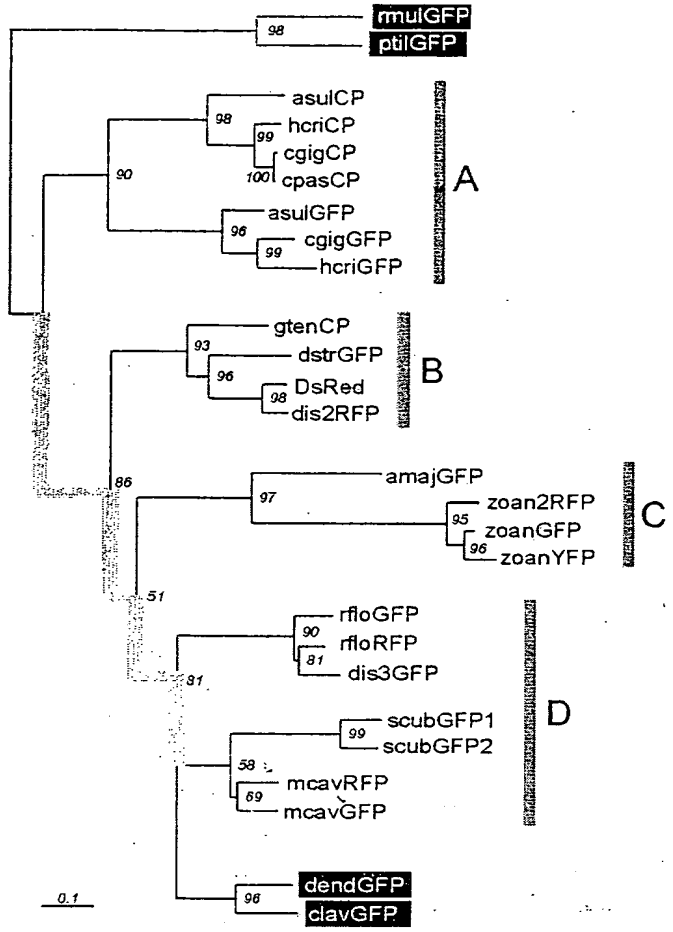
rmulGFP
ptilGFP
98
asulCP
hcriCP
cgigCP
cpasCP
asulGFP
cgigGFP
hcriGFP
98
99
100
90
96
99
A
gtenCP
dstrGFP
DsRed
dis2RFP
93
96
98
B
amajGFP
zoan2RFP
zoanGFP
zoanYFP
86
97
95
96
C
rfloGFP
rfloRFP
dis3GFP
51
90
81
81
scubGFP1
scubGFP2
mcavRFP
mcavGFP
99
58
69
D
dendGFP
clavGFP
96
0.1

Figure 4

Protein ID (original ID)	GenBank accession #	Reference	Taxonomy *Genus species* (Class, Sub-class, Order)	Excitation maxima, nm	Emission maxima, nm	Representative spectra excitation —— emission ---- 400 500 600 nm	color	Representative chromophore structure
amajGFP (amFP486) dstrGFP (dsFP483) clavGFP (cFP484)	AF168421 AF168420 AF168424	2 2 2	*Anemonia majano* (Anthozoa, Zoantharia, Actiniaria) *Discosoma striata* (Anthozoa, Zoantharia, Corallimorpharia) *Clavularia sp.* (Anthozoa, Alcyonaria, Alcyonacea)	458 456 443	486 484 483	458 486 amajGFP A	GREEN	GFP:
GFP cgigGFP hcriGFP	M62653 AY037776 AF420592	34 this paper this paper	*Aequorea victoria* (Hydrozoa, ... , Hydroida) *Condylactis gigantea* (Anthozoa, Zoantharia, Actiniaria) *Heteractis crispa* (Anthozoa, Zoantharia, Actiniaria)	395, 471 399, 482 405, 481	508 496 499	399 496 cgigGFP B		
ptilGFP rmulGFP zoanGFP (zFP506) asulGFP (asFP499) dis3GFP dendGFP mcavGFP rfloGFP scubGFP1 scubGFP2	AY015995 AY015996 AF168422 AF322221 AF420593 AF420591 AY037769 AY037772 AY037767 AY037771	35 35 2 4 this paper this paper this paper this paper this paper this paper	*Ptilosarcus sp.* (Anthozoa, Alcyonaria, Pennatulacea) *Renilla muelleri* (Anthozoa, Alcyonaria, Pennatulacea) *Zoanthus sp.* (Anthozoa, Zoantharia, Zoanthidea) *Anemonia sulcata* (Anthozoa, Zoantharia, Actiniaria) *Discosoma sp.*3 (Anthozoa, Zoantharia, Corallimorpharia) *Dendronephthya sp.* (Anthozoa, Alcyonaria, Alcyonacea) *Montastraea cavernosa* (Anthozoa, Zoantharia, Scleractinia) *Ricordea florida* (Anthozoa, Zoantharia, Corallimorpharia) *Scolymia cubensis* (Anthozoa, Zoantharia, Scleractinia) *Scolymia cubensis* (Anthozoa, Zoantharia, Scleractinia)	500 498 496 403, 480 503 494 506 508 497 497	508 510 506 499 512 508 515 517 506 506	492, 506 zoanGFP C		
zoanYFP (zFP538)	AF168423	2	*Zoanthus sp.* (Anthozoa, Zoantharia, Zoanthidea)	494, 528	538	528 538 zoanYFP 494 D	YELLOW	?
DsRed (drFP583) dis2RFP (dsFP593) zoan2RFP	AF168419 AF272711 AY059642	2 36 this paper	*Discosoma sp.*1 (Anthozoa, Zoantharia, Corallimorpharia) *Discosoma sp.*2 (Anthozoa, Zoantharia, Corallimorpharia) *Zoanthus sp.*2 (Anthozoa, Zoantharia, Zoanthidea)	558 573 553	583 593 574	553 574 zoan2RFP E	ORANGE-RED	DsRed:
mcavRFP rfloRFP	AY037770 AY037773	this paper this paper	*Montastraea cavernosa* (Anthozoa, Zoantharia, Scleractinia) *Ricordea florida* (Anthozoa, Zoantharia, Corallimorpharia)	507, 572 506, 567	519, 580 516, 574	507 519 580 mcavRFP F		?
asulCP (asCP)	AF246709	3, 4	*Anemonia sulcata* (Anthozoa, Zoantharia, Actiniaria)	568	none	568 absorbance only (asulCP) 400 500 600 nm G	PURPLE-BLUE	asulCP:
hcriCP (hcCP) cgigCP (cgCP) cpasCP (cpCP) gtenCP (gtCP)	AF363776 AF363775 AF383155 AF383156	5 5 5 5	*Heteractis crispa* (Anthozoa, Zoantharia, Actiniaria) *Condylactis gigantea* (Anthozoa, Zoantharia, Actiniaria) *Condylactis passiflora* (Anthozoa, Zoantharia, Actiniaria) *Goniopora tenuidens* (Anthozoa, Zoantharia, Scleractinia)	578 571 571 580	none none none none			?

Table 1. Summary of spectral features and chromophore structures in the family of GFP-like proteins. Note that this paper uses different names for GFP-like proteins than proposed in original publications (the original names, where available, are given in brackets in the first column; see text for nomenclature details).

Figure 5

Table 2

clade	colors	Zoantharia orders
A	Green, purple-blue	Actiniaria
B	Green, orange-red, purple-blue	Corallimorpharia, Scleractinia
C	Green, yellow, orange-red	Actiniaria, Zoanthidea
D	Green, orange-red	Corallimorpharia, Scleractinia

Figure 6

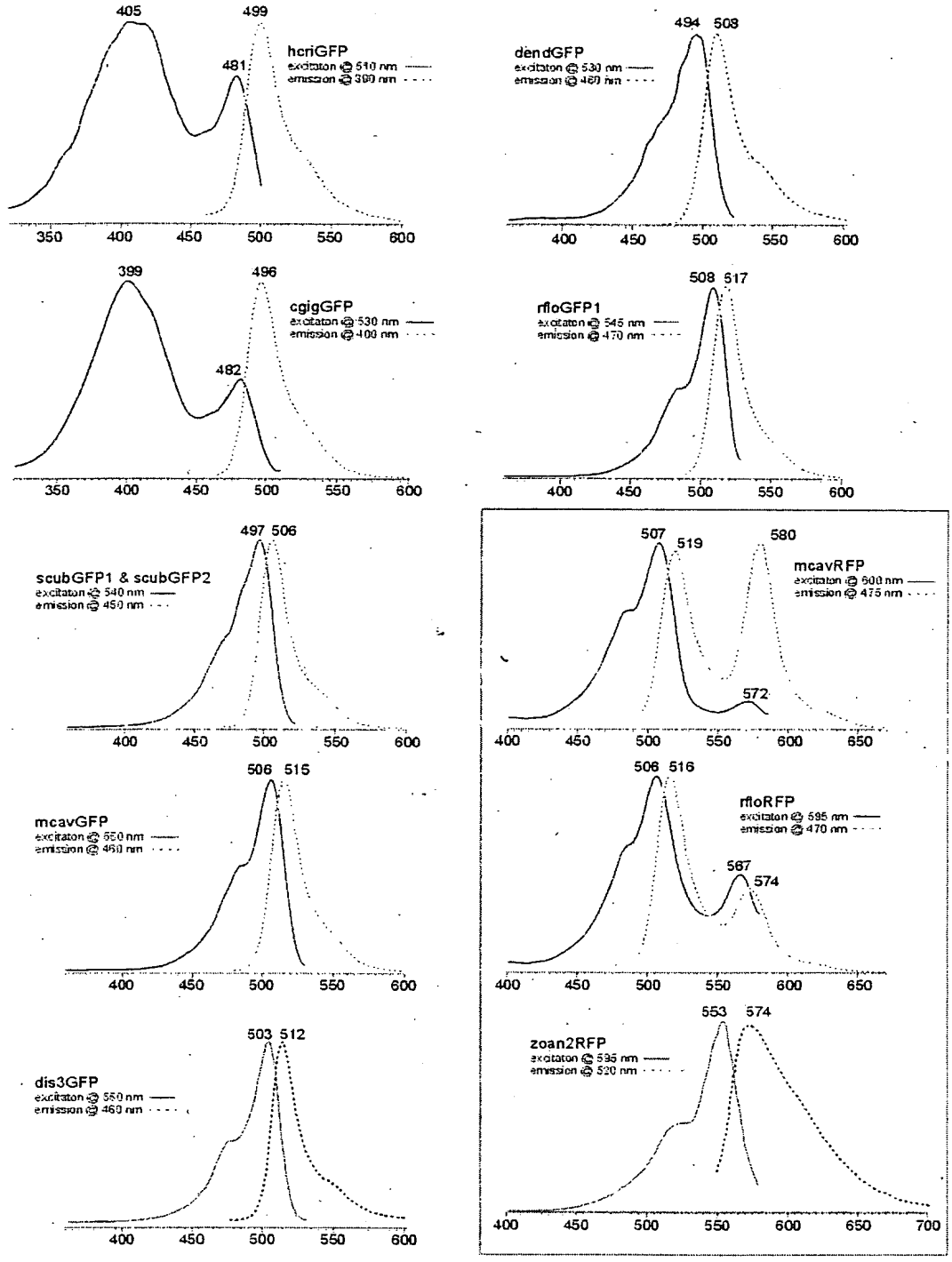
405
499
481
hcriGFP
excitaton @ 510 nm
emission @ 390 nm
350 400 450 500 550 600
494 508
dendGFP
excitaton @ 530 nm
emission @ 480 nm
400 450 500 550 600
399
496
482
cgigGFP
excitaton @ 530 nm
emission @ 400 nm
350 400 450 500 550 600
508 517
rfloGFP1
excitaton @ 545 nm
emission @ 470 nm
400 450 500 550 600
497 506
scubGFP1 & scubGFP2
excitaton @ 540 nm
emission @ 450 nm
400 450 500 550 600
507
519
580
mcavRFP
excitaton @ 600 nm
emission @ 475 nm
572
400 450 500 550 600 650
506 515
mcavGFP
excitaton @ 550 nm
emission @ 460 nm
400 450 500 550 600
506 516
rfloRFP
excitaton @ 595 nm
emission @ 470 nm
567
574
400 450 500 550 600 650
503 512
dis3GFP
excitaton @ 550 nm
emission @ 460 nm
400 450 500 550 600
553 574
zoan2RFP
excitaton @ 595 nm
emission @ 520 nm
400 450 500 550 600 650 700

Figure 7

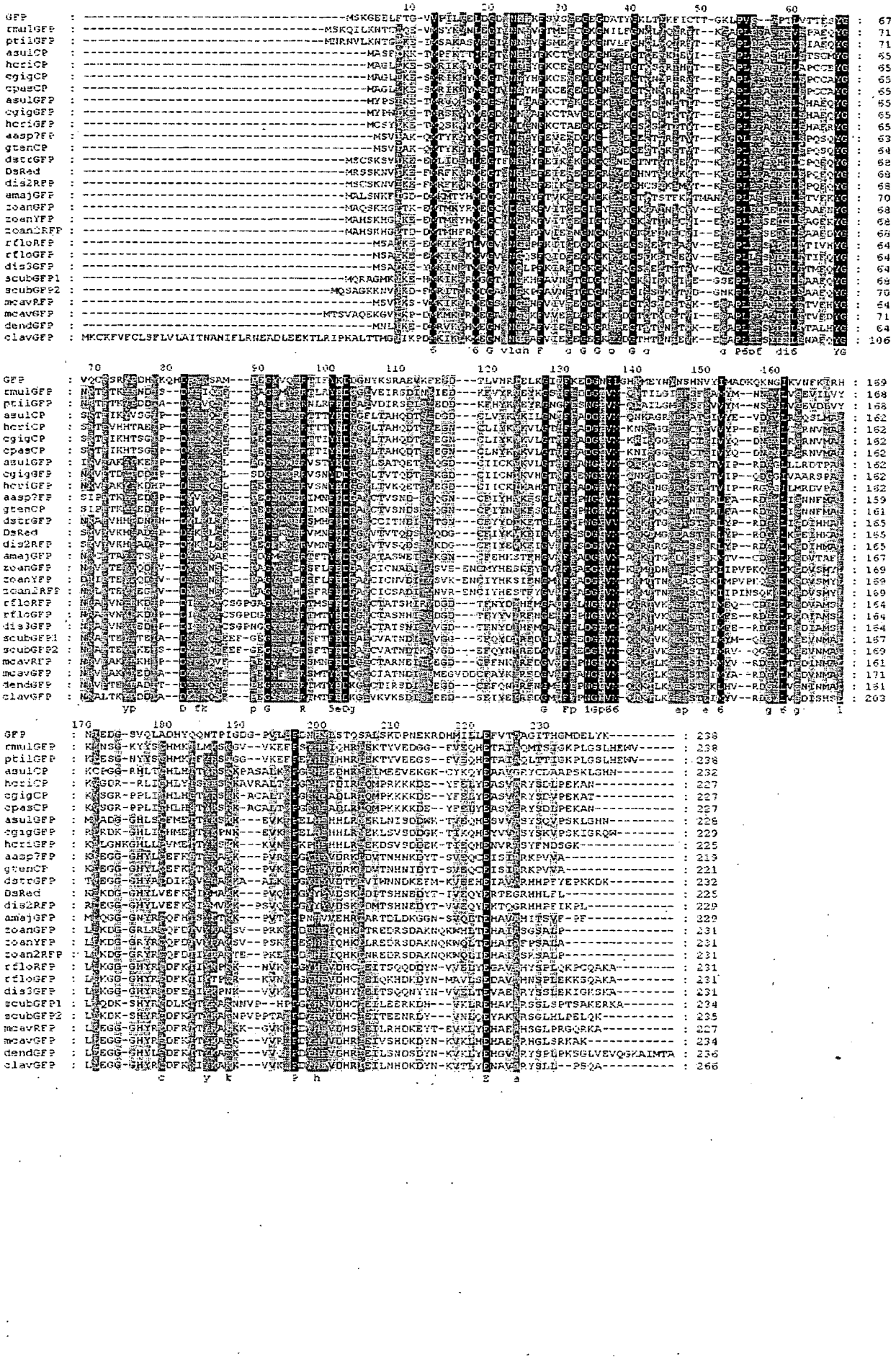

FIGURE 8

Green fluorescent protein from *Heteractis crispa* hcriGFP

```
          10        20        30        40        50        60
ATTTTGGACAGGTGTTCAACCAAGCAAATTTAAGAAGTCATCATCTTTATCTCAGTCAGG

          70        80        90       100       110       120
AAAATGTGTTCTTACATCAAAGAAACCATGCAAAGTAAGGTTTACATGGAAGGAAAAGTT
   M  C  S  Y  I  K  E  T  M  Q  S  K  V  Y  M  E  G  K  V

         130       140       150       160       170       180
AACGACCACAACTTCAAGTGCACTGCAGAAGGAAAAGGAGAACCATACAAAGGCTCACAA
N  D  H  N  F  K  C  T  A  E  G  K  G  E  P  Y  K  G  S  Q

         190       200       210       220       230       240
AGCCTGACGATCACCGTAACTGAAGGAGGTCCTCTGCCATTTGCCTTCGACATTCTTTCA
S  L  T  I  T  V  T  E  G  G  P  L  P  F  A  F  D  I  L  S

         250       260       270       280       290       300
CACGCCTTTCGATATGGCAATAAGGTGTTCGCCAAGTACCCCAAAGATCATCCTGATTTT
H  A  F  R  Y  G  N  K  V  F  A  K  Y  P  K  D  H  P  D  F

         310       320       330       340       350       360
TTTAAGCAGTCTCTTCCTGAAGGTTTTACTTGGGAAAGAGTAAGCAACTATGAGGACGGA
F  K  Q  S  L  P  E  G  F  T  W  E  R  V  S  N  Y  E  D  G

         370       380       390       400       410       420
GGAGTCCTTACCGTTAAACAAGAAACTAGTCTGGAGGGAGATTGCATTATTTGCAAAATT
G  V  L  T  V  K  Q  E  T  S  L  E  G  D  C  I  I  C  K  I

         430       440       450       460       470       480
AAAGCACATGGCACTAACTTCCCCGCAGATGGTCCGGTGATGCAAAAACGGACCAATGGA
K  A  H  G  T  N  F  P  A  D  G  P  V  M  Q  K  R  T  N  G

         490       500       510       520       530       540
TGGGAGCCATCAACTGAAACGGTTATTCCACGGGGTGGAGGAATTCTGATGCGCGATGTG
W  E  P  S  T  E  T  V  I  P  R  G  G  G  I  L  M  R  D  V

         550       560       570       580       590       600
CCCGCACTGAAGCTGCTTGGTAACAAAGGACATCTTCTCTGCGTCATGGAAACAACTTAC
P  A  L  K  L  L  G  N  K  G  H  L  L  C  V  M  E  T  T  Y

         610       620       630       640       650       660
AAGTCAAAAAAAAAAAGGTGAACCTGCCAAACCGCACTTTCATCATTTGAGAATGGAGAAG
K  S  K  K  K  K  G  E  P  A  K  P  H  F  H  H  L  R  M  E  K

         670       680       690       700       710       720
GATAGTGTTAGTGACGATGAGAAGACCATTGAGCAGCACGAGAATGTGAGGGCAAGCTAC
D  S  V  S  D  D  E  K  T  I  E  Q  H  E  N  V  R  A  S  Y

         730       740       750       760       770       780
TTCAATGATAGTGGAAAATGATCATTTCCTTATTGATTTCAATGTTAGGGCATTCAGTTT
F  N  D  S  G  K  *

         790       800       810       820       830       840
CCAAATTTTCTTAGACACAGTCTTTTCCTTTAGCTTCGTAGCCTACTTACCCATGTTTTG

         850       860
TTGAAGTCAATAAATAGCTAAGCACTAC (SEQ ID NOS: 01 & 02)
```

Figure 9

Green fluorescent protein from *Dendronephthya sp.* dendGFP

```
          10         20         30         40         50         60
5'CATATCGAGAAAGTTGTGAAACCAAATTCTTACTCTACTTTTACTACCATGAATCTGATT
                                                  M  N  L  I

          70         80         90        100        110        120
AAAGAAGATATGAGGGTTAAGGTGCATATGGAAGGGAATGTAAACGGGCATGCTTTTGTG
K  E  D  M  R  V  K  V  H  M  E  G  N  V  N  G  H  A  F  V

         130        140        150        160        170        180
ATTGAAGGGGAAGGAAAAGGAAGGCCCTACGAAGGGACACAGACCTTGAACCTGACAGTG
I  E  G  E  G  K  G  R  P  Y  E  G  T  Q  T  L  N  L  T  V

         190        200        210        220        230        240
AAAGAAGGCGCGCCTCTCCCATTTTCTTACGACATCTTGACAACAGCATTGCACTACGGA
K  E  G  A  P  L  P  F  S  Y  D  I  L  T  T  A  L  H  Y  G

         250        260        270        280        290        300
AACAGAGTATTCACTGAATACCCAGCAGATATCACGGATTATTTCAAGCAATCATTTCCT
N  R  V  F  T  E  Y  P  A  D  I  T  D  Y  F  K  Q  S  F  P

         310        320        330        340        350        360
GAAGGATATTCCTGGGAAAGAACCATGACTTATGAAGACAAGGGCATTTGTACCATCAGA
E  G  Y  S  W  E  R  T  M  T  Y  E  D  K  G  I  C  T  I  R

         370        380        390        400        410        420
AGCGACATAAGCTTGGAAGGTGACTGCTTTTTCCAAAACATTCGTTTTAATGGGATGAAC
S  D  I  S  L  E  G  D  C  F  F  Q  N  I  R  F  N  G  M  N

         430        440        450        460        470        480
TTTCCCCCAAATGGTCCAGTTATGCAGAAGAAAACTTTGAAGTGGGAACCATCCACAGAG
F  P  P  N  G  P  V  M  Q  K  K  T  L  K  W  E  P  S  T  E

         490        500        510        520        530        540
AAGCTGCACGTGCGTGATGGGTTGCTTGTCGGTAATATTAACATGGCTCTGCTGCTTGAA
K  L  H  V  R  D  G  L  L  V  G  N  I  N  M  A  L  L  L  E

         550        560        570        580        590        600
GGAGGTGGACATTACCTGTGTGACTTCAAAACTACTTACAAAGCGAAGAAGGTTGTTCAG
G  G  G  H  Y  L  C  D  F  K  T  T  Y  K  A  K  K  V  V  Q

         610        620        630        640        650        660
TTGCCAGATTATCATTTTGTGGACCATCGCATTGAGATCTTGAGTAATGACAGCGATTAC
L  P  D  Y  H  F  V  D  H  R  I  E  I  L  S  N  D  S  D  Y

         670        680        690        700        710        720
AACAAAGTGAAGCTGTACGAGCATGGGGTTGCTCGCTATTCTCCGTTGCCCAAGTCAGGC
N  K  V  K  L  Y  E  H  G  V  A  R  Y  S  P  L  P  K  S  G

         730        740        750        760        770        780
CTGGTAGAGGTTCAAGGGAAAGCCATAATGACTGCATAGATAAACATGTAGTGAAGACCA
L  V  E  V  Q  G  K  A  I  M  T  A  *

         790        800        810        820        830        840
CATACTCGGGATTAGAGTTTAGGGATTGGTAGTTGTGGTAGATTCTAGCCTACAAATTTT
```

TTGGG 3' (SEQ ID NO:03 & 04)

Figure 10
Red fluorescent protein from *Zoanthus sp.* zoanRFP

```
        10        20        30        40        50        60
GAGTTGAGTTCTCGACTTCAGTTGTATCACTTTTGACGTATCAAGTGATCTATTCTCAAC

        70        80        90       100       110       120
ATGGCCCATTCAAAGCACGGACTAACAGATGACATGACAATGCATTTCCGTATGGAAGGG
M  A  H  S  K  H  G  L  T  D  D  M  T  M  H  F  R  M  E  G

       130       140       150       160       170       180
TGCGTCGATGGACATAAGTTTGTAATCGAGGGCAACGGCAATGGAAATCCTTTCAAAGGG
C  V  D  G  H  K  F  V  I  E  G  N  G  N  G  N  P  F  K  G

       190       200       210       220       230       240
AAACAGTTTATTAATCTGTGTGTGATTGAAGGAGGACCACTGCCATTCTCCGAAGACATA
K  Q  F  I  N  L  C  V  I  E  G  G  P  L  P  F  S  E  D  I

       250       260       270       280       290       300
TTGTCTGCTGCGTTTGACTACGGAAACAGGCTCTTCACTGAATATCCTGAAGGCATAGTT
L  S  A  A  F  D  Y  G  N  R  L  F  T  E  Y  P  E  G  I  V

       310       320       330       340       350       360
GACTATTTCAAGAACTCGTGTCCTGCTGGATATACGTGGCACAGGTCTTTTCGCTTTGAA
D  Y  F  K  N  S  C  P  A  G  Y  T  W  H  R  S  F  R  F  E

       370       380       390       400       410       420
GATGGAGCAGTTTGCATATGCAGTGCAGATATAACAGTAAATGTTAGGGAAAACTGCATT
D  G  A  V  C  I  C  S  A  D  I  T  V  N  V  R  E  N  C  I

       430       440       450       460       470       480
TATCATGAGTCCACGTTTTATGGAGTGAACTTTCCTGCTGATGGACCTGTGATGAAAAAG
Y  H  E  S  T  F  Y  G  V  N  F  P  A  D  G  P  V  M  K  K

       490       500       510       520       530       540
ATGACAACTAATTGGGAACCGTCCTGCGAGAAAATCATACCAATAAATAGTCAGAAGATA
M  T  T  N  W  E  P  S  C  E  K  I  I  P  I  N  S  Q  K  I

       550       560       570       580       590       600
TTAAAAGGGGATGTCTCCATGTACCTCCTTCTGAAGGATGGTGGGCGTTACCGCTGCCAG
L  K  G  D  V  S  M  Y  L  L  L  K  D  G  G  R  Y  R  C  Q

       610       620       630       640       650       660
TTTGACACAATTTACAAAGCAAAGACTGAGCCAAAAGAAATGCCGGACTGGCACTTCATC
F  D  T  I  Y  K  A  K  T  E  P  K  E  M  P  D  W  H  F  I

       670       680       690       700       710       720
CAGCATAAGCTCAACCGTGAAGACCGCAGCGATGCTAAGAATCAGAAATGGCAACTGATA
Q  H  K  L  N  R  E  D  R  S  D  A  K  N  Q  K  W  Q  L  I

       730       740       750       760       770       780
GAACATGCTATTGCATCCCGATCTGCTTTACCCTGATAACAAAGGAGTTGCTATTGCATG
E  H  A  I  A  S  R  S  A  L  P  *

       790       800       810       820       830       840
TGCATGCCTATTACGCTGATAAAAATGTAGTTTTAACATGCAATTGTATGTGCATGCACA

       850
TTACCCTGATA                    (SEQ ID NOS:05 & 06)
```

Figure 11

Green fluorescent protein from *Scolymia cubensis* scubGFP1 (AY037767)

```
          10        20        30        40        50        60
5'TGTGACATTCAGTCATATAGGAGCCTCTATCGGAGCTGAGGTCCCATTCACCGTTGTGAT
          70        80        90       100       110       120
TTGGACGGGAGCAGATCGAGAACAACMAGGGCTGTACGAGTCTGATAATTTACTTTACAT
         130       140       150       160       170       180
CTACCAACATGCAGCGTGCTGGGATGAAGGTTAAGGAACATATGAAGATCAAACTGCGTA
           M  Q  R  A  G  M  K  V  K  E  H  M  K  I  K  L  R  M

         190       200       210       220       230       240
TGGGAGGTACTGTAAACGGAAAGCATTTCGCGGTTAATGGGACAGGAGACGGCTACCCTT
  G  G  T  V  N  G  K  H  F  A  V  N  G  T  G  D  G  Y  P  Y

         250       260       270       280       290       300
ATCAGGGAAAACAGATTTTGAAACTTATCGTCGAAGGCAGCGAACCTCTGCCTTTCGCTT
  Q  G  K  Q  I  L  K  L  I  V  E  G  S  E  P  L  P  F  A  F

         310       320       330       340       350       360
TTGATATCTTGTCAGCAGCATTCCAGTATGGCAACAGGGCATTCACCGAATACCCAACAG
  D  I  L  S  A  A  F  Q  Y  G  N  R  A  F  T  E  Y  P  T  E

         370       380       390       400       410       420
AGATAGCAGACTATTTCAAGCAGTCGTTTGAGTTTGGCGAGGGGTTCTCCTGGGAACGAA
  I  A  D  Y  F  K  Q  S  F  E  F  G  E  G  F  S  W  E  R  S

         430       440       450       460       470       480
GTTTCACTTTCGAAGATGGGGCCATTTGCGTCGCCACCAACGATATAACGATGGTTGGTG
  F  T  F  E  D  G  A  I  C  V  A  T  N  D  I  T  M  V  G  G

         490       500       510       520       530       540
GTGAGTTTCAGTATGATATTCGATTTGATGGTCTGAACTTCCCTGAAGATGGTCCAGTGA
  E  F  Q  Y  D  I  R  F  D  G  L  N  F  P  E  D  G  P  V  M

         550       560       570       580       590       600
TGCAAAAGAAAACCGTAAAATGGGAGCCATCCACTGAGATAATGTATATGCAAAATGGAG
  Q  K  K  T  V  K  W  E  P  S  T  E  I  M  Y  M  Q  N  G  V

         610       620       630       640       650       660
TGCTGAAGGGTGAGGTTAACATGGCTCTGTTGCTTCAAGACAAAAGCCATTACCGTTGCG
  L  K  G  E  V  N  M  A  L  L  L  Q  D  K  S  H  Y  R  C  D

         670       680       690       700       710       720
ACCTCAAAACTACTTACAAAGCTAAGAATAATGTGCCGCATCCTCCAGGCTACCACTATG
  L  K  T  T  Y  K  A  K  N  N  V  P  H  P  P  G  Y  H  Y  V

         730       740       750       760       770       780
TGGATCACTGCATTGAAATACTCGAAGAACGTAAGGATCACGTTAAGCTGCGGGAGCATG
  D  H  C  I  E  I  L  E  E  R  K  D  H  V  K  L  R  E  H  A

         790       800       810       820       830       840
CTAAAGCTCGTTCTAGCCTGTCACCTACCAGTGCAAAAGAACGAAAGGCTTAGGTGATAG
  K  A  R  S  S  L  S  P  T  S  A  K  E  R  K  A  *

         850       860       870       880       890       900
TCAAAAAGACAACAAGACGAAAATGAAAGGTGTTCATTGTTAGAATTTGATATTTTCGAT
         910       920       930       940       950       960
TCAATGATTCGTTAAGGGATTTGCTAGAGGCTAGCTAACAGGTTAACATCATAAGGATAG
         970       980       990      1000      1010      1020
AGATTYCGTTGCGGAGTTAGAACCTTWATATTTTCCGAATTCCAMCTAGAGTCGTTGAGA
        1030      1040      1050      1060      1070      1080
AATTTATTAGAGACTAGCTTTAGAGTTACTTTTGTGGAAAAAAAGGTTTCCATTTTTTGC
        1090      1100      1110      1120      1130      1140
GTTATTACAGCATTTAAAGCATAGGAATAGAGATTCGGTTATGGAAAATAACAGTAGGAA
        1150      1160      1170
AATACGTTGTGAAAATAAACTTGTTGTCGAAAAAAAAA 3'
```

(SEQ ID NOS:07&08)

FIGURE 12

Green fluorescent protein from *Scolymia cubensis* scubGFP2 (AY037771)

```
          10        20        30        40        50        60
5'CCTGGTGATTTGGACGAGAGCAGATCGAGAATAGCAAGGTTTTACCAGCGTGATAATTTA
          70        80        90       100       110       120
CTTTACATCTAACAACATGCAATCTGCTGGGAAGAAGAATGTCGTTAAGGACTTCATGAA
                M  Q  S  A  G  K  K  N  V  V  K  D  F  M  K

       130       140       150       160       170       180
GATCACACTGCGTATGGACGGTGCTGTAAACGGGAAGCCCTTCGCGGTTAATGGAACAGG
 I  T  L  R  M  D  G  A  V  N  G  K  P  F  A  V  N  G  T  G

       190       200       210       220       230       240
AGATGGCAACCCTTATGGTGGAATACAGAGTTTGAAGCTTACCGTCGATGGCAACAAACC
 D  G  N  P  Y  G  G  I  Q  S  L  K  L  T  V  D  G  N  K  P

       250       260       270       280       290       300
TCTGCCTTTTGCTTTTGATATCTTGTCAGCAGCATTCCAGTATGGCAACAGGGCATTCAC
 L  P  F  A  F  D  I  L  S  A  A  F  Q  Y  G  N  R  A  F  T

       310       320       330       340       350       360
CGAATACCCAAAAGAGATATCAGACTATTTCAAGCAGTCGTTTGAGTTTGGCGAGGGGTT
 E  Y  P  K  E  I  S  D  Y  F  K  Q  S  F  E  F  G  E  G  F

       370       380       390       400       410       420
TACCTGGGAACGAAGTTTCACTTTCGAAGACGGGGCCATTTGCGTCGCCACGAACGATAT
 T  W  E  R  S  F  T  F  E  D  G  A  I  C  V  A  T  N  D  I

       430       440       450       460       470       480
AAAGATGGTTGGCGATGAGTTTCAATATAACATTCGATTTGATGGTGTGAATTTCCCTGA
 K  M  V  G  D  E  F  Q  Y  N  I  R  F  D  G  V  N  F  P  E

       490       500       510       520       530       540
AGATGGTCCWGTYATGCAGAAGAAAACGGTGAAGTGGGAGCCATCCACAGAGATAATGCG
 D  G  P  V  M  Q  K  K  T  V  K  W  E  P  S  T  E  I  M  R

       550       560       570       580       590       600
TGTGCAAGGTGGAGTGCTAAAGGGTGAGGTTAACATGGCTCTGTTGCTTAAAGACAAAAG
 V  Q  G  G  V  L  K  G  E  V  N  M  A  L  L  L  K  D  K  S

       610       620       630       640       650       660
CCATTACCGATGTGACTTCAAAACTACTTACAAAGCTAAGAATCCTGTCCCGCCGACGGC
 H  Y  R  C  D  F  K  T  T  Y  K  A  K  N  P  V  P  P  T  A

       670       680       690       700       710       720
GCTTCCAGACTACCACTATGTGGATCACTGTATTGAAATCACCGAGGAAAATAGGGATTA
 L  P  D  Y  H  Y  V  D  H  C  I  E  I  T  E  E  N  R  D  Y

       730       740       750       760       770       780
CGTTAAGCTGCAGGAGTATGCTAAAGCTCGTTCTGGCCTGCACCTGCCCGAACTGCAAAA
 V  K  L  Q  E  Y  A  K  A  R  S  G  L  H  L  P  E  L  Q  K

       790       800       810
GTAAAGGCTTAGGCGATAGTCAAGACGACAACGAGAAGA 3'
 *
```

(SEQ ID NO:09 & 10)

FIGURE 13

Red fluorescent protein from *Ricordea florida* rfloRFP (AY037773)

```
         10        20        30        40        50        60
5'TGTGAAAGTTAACATTTTACTTTACTTCTACCAGCATGAGTGCACTCAAAGAGGAAATGA
                                    M  S  A  L  K  E  E  M  K

         70        80        90       100       110       120
AAATCAAGCTTACATTGGTGGGCGTTGTTAACGGGCACCCATTCAAGATCATTGGGGACG
  I  K  L  T  L  V  G  V  V  N  G  H  P  F  K  I  I  G  D  G

        130       140       150       160       170       180
GAAAAGGCAAACCCTATGAGGGATCGCAGGAATTAACCCTTGCCGTGGTGGAAGGAGGGC
  K  G  K  P  Y  E  G  S  Q  E  L  T  L  A  V  V  E  G  G  P

        190       200       210       220       230       240
CTCTGCCTTTCTCTTATGATATCCTGACAACGATAGTTCACTATGGCAACAGGGCATTTG
  L  P  F  S  Y  D  I  L  T  T  I  V  H  Y  G  N  R  A  F  V

        250       260       270       280       290       300
TGAACTACCCAAAGGACATACCAGATATTTTCAAGCAGACCTGCTCTGGTCCTGGTGCTG
  N  Y  P  K  D  I  P  D  I  F  K  Q  T  C  S  G  P  G  A  G

        310       320       330       340       350       360
GATATTCCTGGCAAAGGACCATGAGTTTTGAAGACGGAGGCGTTTGCACTGCTACGAGCC
  Y  S  W  Q  R  T  M  S  F  E  D  G  G  V  C  T  A  T  S  H

        370       380       390       400       410       420
ATATCAGGGTGGATGGCGACACTTTCAATTATGACATTCACTTCATGGGAGCGGATTTCC
  I  R  V  D  G  D  T  F  N  Y  D  I  H  F  M  G  A  D  F  P

        430       440       450       460       470       480
CTCTTAATGGTCCAGTGATGCAGAAAAGAACAGTGAAATGGGAGCCATCCACTGAGATAA
  L  N  G  P  V  M  Q  K  R  T  V  K  W  E  P  S  T  E  I  M

        490       500       510       520       530       540
TGTTTCAATGTGATGGATTGCTGAGGGGTGATGTTGCCATGTCTCTGTTGCTGAAAGGAG
  F  Q  C  D  G  L  L  R  G  D  V  A  M  S  L  L  L  K  G  G

        550       560       570       580       590       600
GCGGCCATTACCGATGTGACTTTAAAACTATTTATAAACCCAAGAAGAATGTCAAGATGC
  G  H  Y  R  C  D  F  K  T  I  Y  K  P  K  K  N  V  K  M  P

        610       620       630       640       650       660
CAGGTTACCATTTTGTGGACCACTGCATTGAGATAACGAGTCAACAGGACGATTACAACG
  G  Y  H  F  V  D  H  C  I  E  I  T  S  Q  Q  D  D  Y  N  V

        670       680       690       700       710       720
TGGTTGAGCTGTACGAGGGTGCTGTAGCCCACTACTCTCCTCTGCAGAAACCATGCCAAG
  V  E  L  Y  E  G  A  V  A  H  Y  S  P  L  Q  K  P  C  Q  A

        730       740       750       760       770       780
CAAAGGCATAAAGCCAAACAACCCAAGAGGACAACAAGACATTTAATCAAATCACATCTT
  K  A  *

        790       800
TGTATTTTTGGTTAGAGTTGAAAAAAA 3'
```

(SEQ ID NO:11 & 12)

FIGURE 14

Green fluorescent protein from *Ricordea florida* rfloGFP (AY037772)

```
          10         20         30         40         50         60
5'AGTCACCTCGGTGTTTTTAGGACAGGAAGGATCACGAGCAAGAGAAGAACTGTGAAAGTT
          70         80         90        100        110        120
AACACTTTACTCTACTTCTACCAGCATGAGTGCACTCAAAGAGGAAATGAAAATCAAGCT
                         M  S  A  L  K  E  E  M  K  I  K  L

       130        140        150        160        170        180
TAAAATGGTGGGCGTTGTTAACGGGCAGTCATTTCAGATCGATGGGGAAGGAAAAGGCAA
 K  M  V  G  V  V  N  G  Q  S  F  Q  I  D  G  E  G  K  G  K

       190        200        210        220        230        240
ACCTTACGAGGGATCACAGAAATTAACCCTTGAAGTGGTGGAAGGAGGGCCTCTGCTCTT
 P  Y  E  G  S  Q  K  L  T  L  E  V  V  E  G  G  P  L  L  F

       250        260        270        280        290        300
CTCTTATGATATCCTGACAACGATATTTCAGTATGGCAACAGGGCATTCGTGAACTACCC
 S  Y  D  I  L  T  T  I  F  Q  Y  G  N  R  A  F  V  N  Y  P

       310        320        330        340        350        360
AAAGGACATACCAGATATTTTCAAGCAGACCTGCTCTGGTCCTGATGGTGGATTTTCCTG
 K  D  I  P  D  I  F  K  Q  T  C  S  G  P  D  G  G  F  S  W

       370        380        390        400        410        420
GCAAAGGACCATGACTTATGAAGACGGAGGGGTTTGCACTGCTTCAAACCACATCAGCGT
 Q  R  T  M  T  Y  E  D  G  G  V  C  T  A  S  N  H  I  S  V

       430        440        450        460        470        480
GGACGGCGACACTTTTTATTATGTGATAAGATTTAATGGAGAGAATTTTCCTCCAAATGG
 D  G  D  T  F  Y  Y  V  I  R  F  N  G  E  N  F  P  P  N  G

       490        500        510        520        530        540
TCCAGTAATGCAGAAAAGAACAGTGAAATGGGAGCCATCCACTGAGATAATGTTTGAACG
 P  V  M  Q  K  R  T  V  K  W  E  P  S  T  E  I  M  F  E  R

       550        560        570        580        590        600
TGATGGATTGCTGAGGGGTGACATTGCCATGTCTCTGTTGCTGAAAGGAGGCGGCCATTA
 D  G  L  L  R  G  D  I  A  M  S  L  L  L  K  G  G  G  H  Y

       610        620        630        640        650        660
CCGATGTGACTTTAAAACTATTTATACACCCAAGAGGAAGGTCAACATGCCAGGTTACCA
 R  C  D  F  K  T  I  Y  T  P  K  R  K  V  N  M  P  G  Y  H

       670        680        690        700        710        720
TTTTGTGGACCACTGCATTGAGATACAGAAGCACGACAAGGATTACAACATGGCTGTGCT
 F  V  D  H  C  I  E  I  Q  K  H  D  K  D  Y  N  M  A  V  L

       730        740        750        760        770        780
CTCTGAGGATGCTGTAGCCCACAACTCTCCTCTGGAGAAAAAAAGCCAAGCAAAGGCGTA
 S  E  D  A  V  A  H  N  S  P  L  E  K  K  S  Q  A  K  A  *

       790
AAGCCAAACAACCTAA 3'
```

(SEQ ID NO:13&14)

Figure 15

Red fluorescent protein from *Montastraea cavernosa* mcavRF? (AY037770)

```
          10        20        30        40        50        60
5'ACGCAGGGATTCACCCTGGTGATTTGGAAGAGAGCAGACCGAGAACAACAAGAGCTGTAT
          70        80        90       100       110       120
AAGGCTGATATCTTACTTTACGTCTACCATCATGAGTGTGATTAAATCAGTCATGAAGAT
 R  L  I  S  Y  F  T  S  T  I  M  S  V  I  K  S  V  M  K  I

         130       140       150       160       170       180
CAAGCTGCGTATGGAAGGCAGTGTAAACGGGCACAACTTCGTAATTGTTGGAGAAGGAGA
 K  L  R  M  E  G  S  V  N  G  H  N  F  V  I  V  G  E  G  E

         190       200       210       220       230       240
AGGCAAGCCTTATGAGGGAACACAGAGTATGGACCTTACAGTCAAAGAAGGCGCACCTCT
 G  K  P  Y  E  G  T  Q  S  M  D  L  T  V  K  E  G  A  P  L

         250       260       270       280       290       300
GCCTTTCGCCTACGATATCATGACAACAGTATTCCATTACGGCAATAGGGTATTCGCAAA
 P  F  A  Y  D  I  M  T  T  V  F  H  Y  G  N  R  V  F  A  K

         310       320       330       340       350       360
ATACCCAAAACATATCCCAGACTATTTCAAGCAGATGTTTCCTGAGGAGTATTCCTGGGA
 Y  P  K  H  I  P  D  Y  F  K  Q  M  F  P  E  E  Y  S  W  E

         370       380       390       400       410       420
ACGAAGCATGAATTTCGAAGGCGGGGGCATTTGCACCGCCAGGAACGAGATAACAATGGA
 R  S  M  N  F  E  G  G  G  I  C  T  A  R  N  E  I  T  M  E

         430       440       450       460       470       480
AGGCGACTGTTTTTTCAATAAAGTTCGATTTGATGGTGTGAACTTCCCCCCCAATGGTCC
 G  D  C  F  F  N  K  V  R  F  D  G  V  N  F  P  P  N  G  P

         490       500       510       520       530       540
AGTCATGCAGAAGAAGACGCTGAAATGGGAGCCATCCACTGAAAAAATGTATGTGCGTGA
 V  M  Q  K  K  T  L  K  W  E  P  S  T  E  K  M  Y  V  R  D

         550       560       570       580       590       600
TGGAGTGCTGACGGGTGATATCAACATGGCTTTGTTGCTTGAAGGAGGTGGCCATTACCG
 G  V  L  T  G  D  I  N  M  A  L  L  L  E  G  G  G  H  Y  R

         610       620       630       640       650       660
ATGTGACTTCAGAACTACTTACAGAGCTAAGAAGAAGGGTGTCAAGTTACCAGATTATCA
 C  D  F  R  T  T  Y  R  A  K  K  K  G  V  K  L  P  D  Y  H

         670       680       690       700       710       720
CTTTGAGGATCACTCCATTGAGATTTTGCGCCATGACAAAGAATACACTGAGGTTAAGCT
 F  E  D  H  S  I  E  I  L  R  H  D  K  E  Y  T  E  V  K  L

         730       740       750       760       770       780
GTATGAGCATGCCGAAGCTCATTCTGGGCTGCCGAGGGTGGCAAAGTAAAGGCTTAACGA
 Y  E  H  A  E  A  H  S  G  L  P  R  V  A  K  *

         790
AAAGCCAAGACCACA 3'
```

(SEQ ID NO:15 & 16)

FIGURE 16

Green fluorescent protein from *Montastraea cavernosa* mcavGFP (AY037769)

```
          10        20        30        40        50        60
5'ATTCGCCCTGGTGATTTGGAAGAGAGCAGATCGAGAACAACAAGAGCTGTAAGGTTGATA
          70        80        90       100       110       120
TCTTACTTACGTCTACCATCATGACAAGTGTTGCACAGGAAAAGGGTGTGATTAAACCAG
                    M  T  S  V  A  Q  E  K  G  V  I  K  P  D

       130       140       150       160       170       180
ACATGAAGATGAAGCTGCGTATGGAAGGTGCTGTAAACGGGCACAAGTTCGTGGTTGAAG
  M  K  M  K  L  R  M  E  G  A  V  N  G  H  K  F  V  V  E  G

       190       200       210       220       230       240
GAGATGGAAAAGGGAAGCCTTTCGACGGAACACAGACTATGGACCTTACAGTCATAGAAG
  D  G  K  G  K  P  F  D  G  T  Q  T  M  D  L  T  V  I  E  G

       250       260       270       280       290       300
GCGCACCATTGCCTTTCGCTTACGATATCTTGACAACAGTATTCGATTACGGCAACAGGG
  A  P  L  P  F  A  Y  D  I  L  T  T  V  F  D  Y  G  N  R  V

       310       320       330       340       350       360
TATTCGCCAAATACCCAGAAGACATAGCAGATTATTTCAAGCAGACGTTTCCTGAGGGGT
  F  A  K  Y  P  E  D  I  A  D  Y  F  K  Q  T  F  P  E  G  Y

       370       380       390       400       410       420
ACTTCTGGGAACGAAGCATGACATACGAAGACCAGGGCATTTGCATCGCCACAAACGACA
  F  W  E  R  S  M  T  Y  E  D  Q  G  I  C  I  A  T  N  D  I

       430       440       450       460       470       480
TAACAATGATGGAAGGCGTCGACGACTGTTTTGCCTATAAAATTCGATTTGATGGTGTGA
  T  M  M  E  G  V  D  D  C  F  A  Y  K  I  R  F  D  G  V  N

       490       500       510       520       530       540
ACTTTCCTGCCAATGGTCCAGTTATGCAGAGGAAGACGCTGAAATGGGAGCCATCCACTG
  F  P  A  N  G  P  V  M  Q  R  K  T  L  K  W  E  P  S  T  E

       550       560       570       580       590       600
AGATAATGTATGCGCGTGATGGAGTGCTGAAGGGTGATGTTAACATGGCTCTGTTGCTTG
  I  M  Y  A  R  D  G  V  L  K  G  D  V  N  M  A  L  L  L  E

       610       620       630       640       650       660
AAGGAGGTGGCCATTACCGATGTGACTTCAAAACTACTTACAAAGCTAAGAAGGTTGTCC
  G  G  G  H  Y  R  C  D  F  K  T  T  Y  K  A  K  K  V  V  R

       670       680       690       700       710       720
GGTTGCCAGACTATCACTTTGTGGACCATCGCATTGAGATTGTGAGCCACGACAAAGATT
  L  P  D  Y  H  F  V  D  H  R  I  E  I  V  S  H  D  K  D  Y

       730       740       750       760       770       780
ACAACAAGGTTAAGCTGCACGAGCATGCCGAAGCTCGTCATGGACTGTCAAGGAAGGCCA
  N  K  V  K  L  H  E  H  A  E  A  R  H  G  L  S  R  K  A  K

       790       800       810       820       830       840
AGTAAAGGCTTAATGAAAAGTCAAGACGACAACGAGGAGAAACAAAGTACTTTTTTGTTA
  *

       850       860       870       880       890       900
AATTTGAAGGCATTTACTCGGAATTAGTATTTGATACTTTCGATTCAAGGATTTGTTCCG
       910       920       930       940       950       960
GGATTTGTTAGAGACTAGCTCTAGAGTTGTATTTTGTGAAAAAAGATAGTTTCCAGTTTT
       970       980       990      1000      1010      1020
TGCGGGATTACAGCATGGGGATAGACTTTTTAAACTCAGTTGTGGTCAAATGCAAGTAAG
      1030      1040      1050      1060
AAAACTGTAGTGAGAATAAACTTGTTATCGAAGCCGAAAAAAAAAA 3'
```

(SEQ ID NOS: 17 & 18)

Figure 17

Green fluorescent protein from *Condylactis gigantea* cgigGFP (AY037776)

```
          10        20        30        40        50        60
5'ACAGCTGTTCATCCACGCTCATTCAAGACGCCGTCAACTTTATTCCAGTCAGGAAAATGT
                                                      M  Y

          70        80        90       100       110       120
ATCCTTGGATCAAGGAAACCATGCGCAGTAAGGTTTACATGGAAGGAGATGTTAACAACC
  P  W  I  K  E  T  M  R  S  K  V  Y  M  E  G  D  V  N  N  H

         130       140       150       160       170       180
ACGCCTTCAAGTGCACTGCAGTAGGAGAAGGAAAACCATACAAAGGCTCACAAGACCTGA
  A  F  K  C  T  A  V  G  E  G  K  P  Y  K  G  S  Q  D  L  T

         190       200       210       220       230       240
CGATTACCGTCACTGAAGGAGGTCCTCTGCCATTTGCTTTCGACATTCTTTCACACGCCT
  I  T  V  T  E  G  G  P  L  P  F  A  F  D  I  L  S  H  A  F

         250       260       270       280       290       300
TTCAGTATGGCAACAAGGTGTTCACCGATTACCCCGACGATATTCCTGATTTCTTTAAGC
  Q  Y  G  N  K  V  F  T  D  Y  P  D  D  I  P  D  F  F  K  Q

         310       320       330       340       350       360
AGTCTCTCTCGGATGGTTTTACTTGGAGAAGAGTAAGCACSTATGACGATGGAGGAGTCC
  S  L  S  D  G  F  T  W  R  R  V  S  T  Y  D  D  G  G  V  L

         370       380       390       400       410       420
TCACAGTTACCCAAGACACTAGTCTGAAGGGAGATTGCATTATTTGCAACATTAAAGTCC
  T  V  T  Q  D  T  S  L  K  G  D  C  I  I  C  N  I  K  V  H

         430       440       450       460       470       480
ATGGCACTAACTTCCCCGAAAATGGTCCGGTGATGCAAAACAAGACCGATGGATGGGAGC
  G  T  N  F  P  E  N  G  P  V  M  Q  N  K  T  D  G  W  E  P

         490       500       510       520       530       540
CATCCAGCACTGAAACGGTTATTCCACAAGATGGAGGAATTGTTGCTGCGCGATCACCCG
  S  S  T  E  T  V  I  P  Q  D  G  G  I  V  A  A  R  S  P  A

         550       560       570       580       590       600
CACTAAGGCTGCGTGATAAAGGTCATCTTATCTGCCACATGGAAACAACTTACAAGCCAA
  L  R  L  R  D  K  G  H  L  I  C  H  M  E  T  T  Y  K  P  N

         610       620       630       640       650       660
ACAAAGAGGTGAAGCTGCCAGAACTCCACTTTCATCATTTGCGAATGGAAAAGCTGAGTG
  K  E  V  K  L  P  E  L  H  F  H  H  L  R  M  E  K  L  S  V

         670       680       690       700       710       720
TTAGTGACGATGGGAAGACCATTAAGCAGCACGAGTATGTGGTGGCTAGCTACTCCAAAG
  S  D  D  G  K  T  I  K  Q  H  E  Y  V  V  A  S  Y  S  K  V

         730       740       750       760       770       780
TGCCTTCGAAGATAGGACGTCAATGATCATTTCCCTTATTAAATATCAATGATGTGGCTT
  P  S  K  I  G  R  Q  *

         790       800       810       820       830       840
TCAATTTTCCAAAATTTTGTTAAGACATAGGTCTTTTGGATTTTTGGTAACCCCAACCTT
         850       860       870       880       890
AATTCCCAATAATTTTTGTTGGAAAGTCAAATAAAACCAGCCTTCCCTGGGCCTTTAA 3'
```

(SEQ ID NOS: 19 & 20)

FIGURE 18

Green fluorescent protein from *Agaricia fragilis* afraGFP (AY037765)

```
          10        20        30        40        50        60
5'CAAGGAAGCCAAATCTTTTACCAGAGATCTCGCGTGAAAGCAACCTATGAGTGATGGCGA
                                                    M  A  I

          70        80        90       100       110       120
TTTCTACTCTAAAGAACGTCATCATCATCGTTATTATATACTCCTGCAGCACTTGTGCTG
  S  T  L  K  N  V  I  I  I  V  I  I  Y  S  C  S  T  C  A  V

         130       140       150       160       170       180
TTTGGTCGAATTCAAACTCTGAATCCTCTTTCACTAATGGGATTGCAGAGGAAATGAAGA
  W  S  N  S  N  S  E  S  S  F  T  N  G  I  A  E  E  M  K  T

         190       200       210       220       230       240
CTAGGGTACATTTGGAGGGTACTGTTAACGGGCACTCCTTTACAATTAAAGGCGAAGGAA
  R  V  H  L  E  G  T  V  N  G  H  S  F  T  I  K  G  E  G  R

         250       260       270       280       290       300
GAGGCTACCCTTACAAAGGAGAACAGTTTATGAGCCTTGAGGTCGTCAATGGTGCTCCTC
  G  Y  P  Y  K  G  E  Q  F  M  S  L  E  V  V  N  G  A  P  L

         310       320       330       340       350       360
TGCCGTTCTCTTTTGATATCTTGACACCAGCATTTATGTATGGCAACAGAGTGTTCACCA
  P  F  S  F  D  I  L  T  P  A  F  M  Y  G  N  R  V  F  T  K

         370       380       390       400       410       420
AGTACCCACCAAACATACCAGACTATTTCAAGCAGACGTTTCCTGAAGGGTATCACTGGG
  Y  P  P  N  I  P  D  Y  F  K  Q  T  F  P  E  G  Y  H  W  E

         430       440       450       460       470       480
AAAGAAACATTCCCTTTGAAGATCAGGCCGCGTGCACGGTAACCAGCCACATAAGATTGG
  R  N  I  P  F  E  D  Q  A  A  C  T  V  T  S  H  I  R  L  E

         490       500       510       520       530       540
AAGAGGAAGAGAGGCGTTTTGTAAATAACGTCAGATTTCACTGTGTGAACTTTCCCCCTA
  E  E  E  R  R  F  V  N  N  V  R  F  H  C  V  N  F  P  P  N

         550       560       570       580       590       600
ATGGTCCAGTCATGCAGAGGAGGATACTGAAATGGGAGCCATCCACTGAGAACATTTATC
  G  P  V  M  Q  R  R  I  L  K  W  E  P  S  T  E  N  I  Y  P

         610       620       630       640       650       660
CGCGTGATGGGTTTCTGGAGGGCCATGTTGATATGACTCTTCGGGTTGAAGGAGGTGGCT
  R  D  G  F  L  E  G  H  V  D  M  T  L  R  V  E  G  G  G  Y

         670       680       690       700       710       720
ATTACCGAGCTGAGTTCAAAAGTACTTACAAAGGGAAGACCCCAGTCCGCGACATGCCAG
  Y  R  A  E  F  K  S  T  Y  K  G  K  T  P  V  R  D  M  P  D

         730       740       750       760       770       780
ACTTTCACTTCATAGACCACCGCATTGAGATTACGGAGCATGACGAAGACTACACCAATG
  F  H  F  I  D  H  R  I  E  I  T  E  H  D  E  D  Y  T  N  V

         790       800       810       820       830       840
TTGAGCTGCATGACGTATCCTGGGCTCGTTACTCTATGCTGCCGACTATGTAAGCGGAAA
  E  L  H  D  V  S  W  A  R  Y  S  M  L  P  T  M

         850       860       870       880       890       900
AGGCAAGGCAACAAGACGCAAAACCGCCCTGTTTGTCTCTTTTCATAAGAGATTTGACAA
         910       920       930       940       950       960
CCGTGGTTCTTTGCCATTTAATTTGAATTAGTTTAAATTAAATCTTTGGGATTGATGTAG
         970       980       990      1000      1010      1020
ACGCTTTGGTTGCTAAGTAAGAAAACATTTGTGATTATTAAATTTGTTGCCTGAAGCAAA
        1030
AAAAAAAAAA 3'
```

(SEQ ID NOS:21 & 22)

FIGURE 19

Green fluorescent protein from *Ricordea florida* rfloGFP2 (AY037774)

```
           10         20         30         40         50         60
 5'AGCCACTTCGGTGTCTTGTCGAGAGGAAGGATCACGAACAAGAGAAGAGCTGTAAAAGTT
           70         80         90        100        110        120
   AAAATTTTACTTTACTTCTTCCAGCATGAATGCACTTCAAGAGGAAATGAAAATCAAGCT
                           M  N  A  L  Q  E  E  M  K  I  K  L

         130        140        150        160        170        180
   TACAATGGTGGGCGTTGTTAACGGGCAGTCATTTAAGATCGATGGGAAAGGAAAAGGGAA
    T  M  V  G  V  V  N  G  Q  S  F  K  I  D  G  K  G  K  G  K

         190        200        210        220        230        240
   ACCTTACGAGGGATCACAGGAATTGACCCTTAAAGTGGTGGAAGGCGGGCCTCTGCTCTT
    P  Y  E  G  S  Q  E  L  T  L  K  V  V  E  G  G  P  L  L  F

         250        260        270        280        290        300
   CTCTTATGATATCCTGACAACGATATTTCAGTATGGCAACAGGGCATTCGTGAACTACCC
    S  Y  D  I  L  T  T  I  F  Q  Y  G  N  R  A  F  V  N  Y  P

         310        320        330        340        350        360
   AAAGGACATACCAGATATTTTCAAGCAAACGTGTTCTGGTCTTGATGGCGGATATTCGTG
    K  D  I  P  D  I  F  K  Q  T  C  S  G  L  D  G  G  Y  S  W

         370        380        390        400        410        420
   GCAAAGGACCATGACTTATGAGGACGGAGGGGTTTGTACTGCTACAAGCAACGTCAGCGT
    Q  R  T  M  T  Y  E  D  G  G  V  C  T  A  T  S  N  V  S  V

         430        440        450        460        470        480
   GGTCGGCGACACTTTCAATTATGAAATTCACTTTATGGGGGCGAATTTTCCTCCAAATGG
    V  G  D  T  F  N  Y  E  I  H  F  M  G  A  N  F  P  P  N  G

         490        500        510        520        530        540
   TCCRGTGATGCAGAAAAGAACAGTGAAGTGGGAGCCCTCCACTGAGATAATGTTTGAACG
    P  V  M  Q  K  R  T  V  K  W  E  P  S  T  E  I  M  F  E  R

         550        560        570        580        590        600
   TGATGGATTGCTGAGGGGTGATGTTCCCATGTCTCTGTTGCTGAAAGGAGGCGACCATTA
    D  G  L  L  R  G  D  V  P  M  S  L  L  L  K  G  G  D  H  Y

         610        620        630        640        650        660
   CCGATGTGACTTTAAAACTATTTATAAACCCAACAAGAAGGTCAAGCTGCCAGGTTACCA
    R  C  D  F  K  T  I  Y  K  P  N  K  K  V  K  L  P  G  Y  H

         670        680        690        700        710        720
   TTTTGTGGACCACTGCATTGAGATAAAGAGTCAAGAGAATGATTACAACATGGTTGCGCT
    F  V  D  H  C  I  E  I  K  S  Q  E  N  D  Y  N  M  V  A  L

         730        740        750        760        770        780
   CTTTGAGGATGCTGTAGCACACTACTCTCCTCTGGAGAAAAAGAGCCAGGCAAAGGCGTA
    F  E  D  A  V  A  H  Y  S  P  L  E  K  K  S  Q  A  K  A  *

        790        800        810        820        830        840
   AATCCAAACAACCTAAGAAGACGACAAGGCATTCAATCTAATCGCATGTTTGAATTTTTG
        850        860        870        880        890        900
   GTTAGGAATGTGTTGGGTCAGACTAGGTCTAGAACGTTTCATTTTGGCTGGATTTGTTTT
        910        920        930        940        950        960
   ACTCAGTTATAGACAAGAAAAAAATCTTAAATGACTTGGGTTGGATTTAGCTTTCGGCAC
        970        980        990       1000       1010       1020
   TGTCAATTCCGGATTCCTTAGAAATATTTGAGACCAAGCCTTTTTTTGAGCTGAGAACGT

   AATC 3'
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(SEQ ID NOS: 23 & 24)

FIGURE 20

Green fluorescent protein from *Montastraea cavernosa* mcavGFP2 (AY037768)

```
          10        20        30        40        50        60
5'AGAGCTGTAGGGTGATATCTTACTTACGTCTACCATCATGACCAGTGTTGCACAGGAAAA
                                      M  T  S  V  A  Q  E  K

          70        80        90       100       110       120
GGGTGTGATTAAACCAGACATGAAGATGAAGCTGCGTATGGAAGGTGCTGTAAACGGGCA
 G  V  I  K  P  D  M  K  M  K  L  R  M  E  G  A  V  N  G  H

         130       140       150       160       170       180
CAAGTTCGTGATTGAAGGAGATGGAAAAGGGAAGCCTTTCGACGGAACACAGACTATGGA
 K  F  V  I  E  G  D  G  K  G  K  P  F  D  G  T  Q  T  M  D

         190       200       210       220       230       240
CCTTACAGTCATAGAAGGCGCACCATTGCCTTTCGCTTACGCTATCTTGACAACAGTATT
 L  T  V  I  E  G  A  P  L  P  F  A  Y  A  I  L  T  T  V  F

         250       260       270       280       290       300
CGATTACGGCAACAGGGTATTCGCCAAATACCCAGAAGACATAGCAGATTATTTCAAGCA
 D  Y  G  N  R  V  F  A  K  Y  P  E  D  I  A  D  Y  F  K  Q

         310       320       330       340       350       360
GACATTTCCTGAGGGGTACTTCTGGGAACGAAGCATGACATACGAAGACCAGGGCATTTG
 T  F  P  E  G  Y  F  W  E  R  S  M  T  Y  E  D  Q  G  I  C

         370       380       390       400       410       420
CATCGCCACAAACGACATAACAATGATGAAAGGCGTCGACGACTGTTTTGTCTATAAAAT
 I  A  T  N  D  I  T  M  M  K  G  V  D  D  C  F  V  Y  K  I

         430       440       450       460       470       480
TCGATTTGATGGTGTGAACTTTCCTGCCAATGGTCCAGTTATGCAGAGGAAGACGCTGAA
 R  F  D  G  V  N  F  P  A  N  G  P  V  M  Q  R  K  T  L  K

         490       500       510       520       530       540
ATGGGAGCCATCCACTGAGAAAATGTATGCGCGTGATGGAGTGCTGAAGGGTGATGTTAA
 W  E  P  S  T  E  K  M  Y  A  R  D  G  V  L  K  G  D  V  N

         550       560       570       580       590       600
CATGGCTCTGTTGCTTGAAGGAGGTGGCCATTACCGATGTGACTTCAAAACTACTTACAG
 M  A  L  L  L  E  G  G  G  H  Y  R  C  D  F  K  T  T  Y  R

         610       620       630       640       650       660
AGCTAAGAAGGTTGTCCAGTTGCCAGACTATCATTTTGTGGACCATCGCATTGAGATTGT
 A  K  K  V  V  Q  L  P  D  Y  H  F  V  D  H  R  I  E  I  V

         670       680       690       700       710       720
GAGCCACGACAAAGATTACAACAAGGTTAAGCTGTATGAGCATGCCGAAGCTCATTCTGG
 S  H  D  K  D  Y  N  K  V  K  L  Y  E  H  A  E  A  H  S  G

         730       740       750       760       770       780
GCTGCCGAGGCAGGCCAAGTAAAGGCTTAATGAAAAGCCAAGACGACAACAAGGAGAAAC
 L  P  R  Q  A  K  *

         790       800       810       820       830       840
AAAGTATTTTTTTTGTTAAATTTCAAGGCATTTACTCGGAATTAGTATTTGATACTTTCG
         850       860       870       880       890       900
ATTCAAGGATTTGTTTCGGGACTTGTTAGAGACCAGCTCTAGAGTTGTATTTTGTGAAAA
         910
AAAGATAGTTTCC 3'
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(SEQ ID NOS: 25 & 26)

FIGURE 21

Green fluorescent protein homolog from *Montastraea annularis* mannFP (AY037766)

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          10        20        30        40        50        60
5'TGGTTAACGCAGAGTCGCGGGGGGTTCCTGGCTAATAATTGATTCTATTTTGGGTGTGAC
          70        80        90       100       110       120
ATTCAGGTTTAAAGCAGCATCCTCAGTGCTGAGGTCTCATTCACCCTGGTGATTTGGAAG
         130       140       150       160       170       180
AGAGCAGATCGAGAACACCAAGAGCTGTATTACGCTAAAATCTTACTTGCCTCTACCACC
         190       200       210       220       230       240
ATGAGTATGATTAAACCAGAAATGAAGATCAAGATGCGTATGGACGGTGCTGTAAACGGG
M  S  M  I  K  P  E  M  K  I  K  M  R  M  D  G  A  V  N  G

         250       260       270       280       290       300
CACAAGTTCGTGATTACAGGGGAAGGAAGCGGCGAGCCTTTCGAGGGAAAACAGACTATG
H  K  F  V  I  T  G  E  G  S  G  E  P  F  E  G  K  Q  T  M

         310       320       330       340       350       360
AACCTGACAGTCATAGACGGCGGACCTCTGCCTTTCGCTTTCGACATCTTGACAACAGCA
N  L  T  V  I  D  G  G  P  L  P  F  A  F  D  I  L  T  T  A

         370       380       390       400       410       420
TTCGATTACGGCAMCAGGGTATTCGCCAAATACCCAGAAGACATCCCAGACTATTTCAAG
F  D  Y  G  X  R  V  F  A  K  Y  P  E  D  I  P  D  Y  F  K

         430       440       450       460       470       480
CAGTCGTTTCCTGAGGGGTTTTCTTGGGAACGAAGCATGACTTACGAAGACGGGGGCATT
Q  S  F  P  E  G  F  S  W  E  R  S  M  T  Y  E  D  G  G  I

         490       500       510       520       530       540
TGCATCGCCACAAATGACATAAAAATGGAAGGCGACTGCTTTTCCTATGAAATTCGATTT
C  I  A  T  N  D  I  K  M  E  G  D  C  F  S  Y  E  I  R  F

         550       560       570       580       590       600
GATGGGGTGAACTTTCCTGCCAATAGTCCAGTTATGCAGAAGAAGACCGTGAAATGGGAG
D  G  V  N  F  P  A  N  S  P  V  M  Q  K  K  T  V  K  W  E

         610       620       630       640       650       660
CCATGCACTGRGGAAATGTATGTGCGTGATGGAGTGCTTAAAGGTGGTCTTAACATGGCT
P  C  T  X  E  M  Y  V  R  D  G  V  L  K  G  G  L  N  M  A

         670       680       690       700       710       720
CTGTTGCTTGAAGGAGGTGGCCATTTCCGATGTGACTTGAAAACTACTTACAAAGCTAAG
L  L  L  E  G  G  G  H  F  R  C  D  L  K  T  T  Y  K  A  K

         730       740       750       760       770       780
AAGGTTGTCCAGATGCCAGACTATCACTTTGTGAATCACCGACTTGAGATAACATGGCAT
K  V  V  Q  M  P  D  Y  H  F  V  N  H  R  L  E  I  T  W  H

         790       800       810       820       830       840
GACGAGGATTACAACAATGTTAAGCTGTCTGAGCATGCAGAAGCTCATTCTGGACTGCCA
D  E  D  Y  N  N  V  K  L  S  E  H  A  E  A  H  S  G  L  P

         850       860       870       880       890       900
AGGCAGGCCAAATAAAGGCTTGACGAAAAGCCAAAACGGCAAAGAGTACAAGAAAGTATA
R  Q  A  K  *

         910       920       930       940       950       960
TATAAATGTATATTTTTCAACTGAAAGGCATTCCACTCGGAATTAGTATTTGATACTTTC
        970       980       990      1000      1010      1020
AATTCAAGGATTTATTTTGGGATTTGCTAGCCACTAGCTTTATTGTTAAATTAAGTTAAA
       1030      1040      1050      1060      1070      1080
GACGGTTTAGCATTTTTTCGGTATTACAACATAGGCACAGACGTCTTAACCCCAGTAGTG
       1090      1100      1110      1120      1130
GTCAGGTACAAGTAAGAAAACTTTGGTGAGAATAGACTTGTAGTCGAAAAAAA 3'
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(SEQ ID NOS:27 & 28)